

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**Page 1 of 1

PATENT NO. : 7,452,703

APPLICATION NO.: 10/802,637

ISSUE DATE : November 18, 2008

INVENTOR(S) : Kenneth R. Czerwinski and Martin F. Polz

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the claims:

In column 27, line 18, please delete the word --isotopes-- and replace it with the word --isotope--

In column 28, line 54, please delete the word --competes-- and replace it with the word --compete--

In column 30, line 2, please insert the letter --a-- after the word "from" but before the word "microorganism"

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Choate, Hall & Stewart LLP
2 International Place
Boston, MA 02110

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**UNITED STATES PATENT AND TRADEMARK OFFICE
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Page 1 of 1

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APPLICATION NO.: 10/802,637
ISSUE DATE : November 18, 2008
INVENTOR(S) : Kenneth R. Czerwinski and Martin F. Polz

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In the claims:

In column 27, line 18, please delete the word --isotopes-- and replace it with the word --isotope--

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In column 30, line 2, please insert the letter --a-- after the word "from" but before the word "microorganism"

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2 International Place
Boston, MA 02110

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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
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ATTORNEY'S DOCKET NUMBER: 0492611-0546 (MIT 9986)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.: 7,452,703
Issue Date: November 18, 2008
Applicants: Czerwinski, *et al.*
Application No.: 10/802,637
Filing Date: March 17, 2004 Conf. No.: 4916
Title: Uranium Enrichment Using Microorganisms

ATTN: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CERTIFICATE OF CORRECTION
UNDER 37 C.F.R. § 1.322

Dear Madam:

Patentee respectfully requests that a Certificate of Correction be issued to correct certain inadvertent errors in the above-identified U.S. Patent.

The exact location where the errors occur in the issued patent is as follows:

In column 27, line 18, under claim 1, please replace “isotopes” with “isotope.”

In column 28, line 54, under claim 36, please replace “competes” with “compete.”

In column 30, line 2, under claim 61(b), please insert “a” between the words “from” and “microorganism.”

Patentee submits that the above-described errors in issued claims 1, 36, and 61 incurred through the fault of the Office since the correct terms were used in the corresponding claims during the prosecution of the application. A copy of the Response to Office Action filed on May 27, 2008, including the claims that were later allowed, is enclosed as Exhibit A. Claims 1, 61

and 101 on Exhibit A correspond to issued claims 1, 36, and 61, respectively, and relevant text is circled to show that correct terms were used by Applicant. 37 C.F.R. § 1.322(a) states “[t]he Director may issue a certificate of correction pursuant to 35 U.S.C. § 254 to correct a mistake in a patent, incurred through the fault of the Office, which mistake is clearly disclosed in the records of the Office.” Patentee therefore respectfully requests that a certificate of correction under 37 C.F.R. § 1.322(a) be issued.

Attached in duplicate is Certificate of Correction Form PTO/SB/44 with at least one copy being suitable for printing.

Please send the Certificate of Correction to:

Fangli Chen, Ph.D.
Choate, Hall & Stewart LLP
Two International Place
Boston, Massachusetts 02110

Patentee believes that there is no fee associated with this Request under 37 C.F.R. § 1.322(b). If, however, Patentee is mistaken, please charge any required fees associated with this request to our Deposit Account No. 03-1721.

Respectfully submitted,

Dated: March 31, 2009

/Fangli Chen/
Fangli Chen, Ph.D.
Attorney for Applicant
Registration No. 51,551

PATENT DEPARTMENT
CHOATE, HALL & STEWART, LLP
Two International Place
Boston, MA 02110
Tel: (617) 248-5000
Fax: (617) 502-5002

ATTORNEY DOCKET NO. 0492611-0546

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|--------------|---|-------------------|---------------------|
| Applicant: | Czerwinski <i>et al.</i> | Examiner: | Lilling, Herbert J. |
| Serial No.: | 10/802,637 | Art Unit: | 1657 |
| Filing Date: | March 17, 2004 | Confirmation No.: | 4916 |
| Title: | URANIUM ENRICHMENT USING MICROORGANISMS | | |

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE TO OFFICE ACTION

Sir:

This paper is filed in response to the Office Action mailed on January 24, 2008. A petition and fee for a one-month extension of time for response, up to and including May 27, 2008 are enclosed. If any further petition or fee is required, please consider this a conditional petition therefor and authorization to charge Deposit Account No. 03-1721.

Amendments to the Claims are reflected in the listing of claims that begins on page 2 of this paper; and

Remarks begin on page 13 of this paper.

AMENDMENTS TO THE CLAIMS

The following list of claims will replace all prior versions and lists of claims in the application.

Listing of Claims:

1. (Currently amended) A method for ~~separating~~ enriching an isotopes of an actinide element comprising steps of:
 - (a) ~~providing a composition comprising molecules comprising an actinide element, wherein at least some of the molecules include a first isotope and of the actinide element and at least some of the molecules include a second isotope of the actinide element; and~~
 - (b) ~~exposing the molecules comprising the actinide element contacting the composition with microorganisms that have to reducing activity of the actinide element. reducing microorganisms, wherein the microorganisms preferentially reduce the second isotope of the actinide element and thereby allowing formation of a precipitate comprising the actinide element, wherein the precipitate second composition comprising reduced actinide element contains a higher proportion of the second isotope relative to the first isotope than was present in the original composition, thereby effecting enriching the second isotope of the actinide element. a separation of the first and second isotopes; and~~
~~effecting an increased separation of the first and second isotopes present in the precipitate using any suitable process.~~
2. (Currently amended) The method of claim 1, ~~wherein the exposing step comprises:~~
~~combining the composition and the microorganisms in a vessel together with is provided in a culture medium, thereby producing a culture; and~~
~~maintaining the culture for a time sufficient to allow formation of a precipitate.~~
3. (Currently amended) The method of claim 1, wherein the second composition is insoluble, ~~further comprising the step of:~~

~~_____ separating the precipitate from unprecipitated molecules containing the actinide element.~~

4. (Currently amended) The method of claim 3, wherein the method further comprises a the step of separating comprises collecting the second composition precipitate.
5. (Currently amended) The method of claim 3, wherein the method further comprises a the step of separating comprises collecting the second composition precipitate and the microorganisms.
6. (Currently amended) The method of claim 5, wherein the method further comprisesing the a step of removing from treating the microorganisms to remove molecules the adsorbed composition containing adsorbed, unreduced actinide element atoms therefrom.
7. (Currently amended) The method of claim 1, wherein ~~the exposing step (b)~~ is performed for a time period between 0.05 and 100 hours~~selected to achieve optimum isotope separation.~~
8. (Canceled)
9. (Currently amended) The method of claim 74, wherein ~~the exposing step (b)~~ is performed for a time period between 0.1 and 50 hours~~selected to achieve reduction of less than 80% of the actinide element.~~
10. (Currently amended) The method of claim 74, wherein ~~the exposing step (b)~~ is performed for a time period between 0.1 and 20 hours~~selected to achieve reduction of less than 60% of the actinide element.~~
11. (Currently amended) The method of claim 74, wherein ~~the exposing step (b)~~ is performed for a time period between 0.1 and 10 hours~~selected to achieve reduction of less than 40% of the actinide element.~~

12. (Currently amended) The method of claim 74, wherein ~~the exposing step (b)~~ is performed for a time period between 0.1 and 5 hours~~selected to achieve reduction of less than 20% of the actinide element~~.
- 13-21. (Canceled)
22. (Currently amended) The method of claim 1, wherein the method further comprising the a step of:
determining the isotope content of the second composition~~precipitate~~.
23. (Currently amended) The method of claim 1, wherein the method ~~effecting step~~ further comprises steps of:
(c) ~~converting~~ re-oxidizing the reduced actinide element present in the second composition ~~into a form suitable for repetition of the exposing step~~; and
(d) repeating steps (a) and (b) the exposing step using the re-oxidized converted actinide element as a starting material, thereby further enriching the second isotope of the actinide element~~effecting an increased separation of the first and second isotopes~~.
- 24-36. (Canceled)
37. (Original) The method of claim 1, wherein the steps are performed in batch mode.
38. (Original) The method of claim 1, wherein the steps are performed in continuous mode.
39. (Canceled)
40. (Currently amended) The method of claim 1, wherein the microorganisms are ~~present in a medium that is separated from the composition~~ by a semi-permeable membrane ~~during the exposing step, which wherein the~~ semi-permeable membrane allows diffusion of the composition comprising the first and second isotope of the actinide element ~~containing molecules but does not permit passage of the microorganisms~~.

41. (Currently amended) The method of claim 40, wherein ~~the exposing step (b)~~ comprises allowing the composition to flow continuously past the semi-permeable membrane, thereby ~~allowing diffusion of the actinide element containing molecules so as to expose them to the reducing activity of~~ contacting the microorganisms.
42. (Canceled)
43. (Currently amended) The method of claim 40~~42~~, wherein the microorganisms are present in a medium and wherein the composition and the medium ~~containing the microorganisms~~ flow in opposite directions.
44. (Currently amended) The method of claim 1, further comprising ~~the a~~ step of: immobilizing the microorganisms prior to performing ~~the exposing step (b)~~.
45. (Original) The method of claim 44, wherein the step of immobilizing the microorganisms comprises:
fixing the microorganisms to a solid support.
46. (Original) The method of claim 44, wherein the microorganisms are contained within a semi-permeable membrane or membranes.
47. (Currently amended) The method of claim 44, wherein ~~the exposing step (b)~~ comprises allowing the composition to traverse ~~the~~ immobilized microorganisms.
48. (Original) The method of claim 1, wherein the actinide element is uranium.
49. (Currently amended) The method of claim 48, wherein ~~the precipitate~~ second composition comprises uraninite.
50. (Original) The method of claim 48, wherein the microorganisms reduce uranium from the U(VI) state to the U(IV) state.

51. (Original) The method of claim 48, wherein the first isotope is heavier than the second isotope.
52. (Original) The method of claim 48, wherein the first uranium isotope is U-238.
53. (Original) The method of claim 48, wherein the second uranium isotope is U-235.
54. (Original) The method of claim 48, wherein the first uranium isotope is U-238 and the second uranium isotope is U-235.
55. (Original) The method of claim 1, wherein the method achieves a separation factor of at least 1.02.
56. (Original) The method of claim 1, wherein the method achieves a separation factor of at least 1.06.
57. (Original) The method of claim 1, wherein the method achieves a separation factor of at least 1.10.
58. (Withdrawn) The method of claim 1, wherein the actinide element is plutonium.
59. (Withdrawn) The method of claim 1, wherein the actinide element is neptunium.
60. (Original) The method of claim 1, wherein the composition comprises an electron donor.
61. (Currently amended) The method of claim 1, wherein the molecules composition comprising the actinide element are provided together with a counter ion, wherein the counter ion is are not an electron accepting species that competes with the actinide element for reduction by the microorganisms.
62. (Withdrawn) The method of claim 61, wherein the counter ion can serve as a substrate for metabolism by the microorganisms under anaerobic conditions.

63. (Currently amended) The method of claim 61, wherein the counter ions ~~is~~ are selected from the group consisting of: lactate, acetate, and chloride.
64. (Original) The method of claim 1, wherein the microorganisms are metal or sulfate reducing bacteria.
65. (Original) The method of claim 1, wherein the microorganisms are facultative aerobes.
66. (Withdrawn) The method of claim 1, wherein the microorganisms are anaerobes.
67. (Original) The method of claim 1, wherein the microorganisms are members of a bacterial genus selected from the group consisting of: *Clostridium*, *Shewanella*, *Geobacter*, *Pyrobaculum*, *Desulfotomaculum*, and *Desulfovibrio*.
68. (Original) The method of claim 67, wherein the microorganisms are members of bacterial genus *Shewanella*.
69. (Original) The method of claim 67, wherein the microorganisms are members of bacterial strain *Shewanella oneidensis*.
70. (Withdrawn) The method of claim 67, wherein the microorganisms are selected from the group consisting of *Clostridium* sp., *Deinococcus radiodurans* R1, *Geobacter chapelleii*, *Geobacter hydrogenophilus* H2, *Geobacter hydrogenophilus* H2, *Geobacter* H4, *Geobacter* TACP-2, *Geobacter* TACP-3, *Pyrobaculum islandicum*, *Shewanella alga*, *Shewanella saccharophila*, *Desulfotomaculum reducens* MI-1, *Desulfovibrio desulfuricans*, and *Desulfovibrio vulgaris*.
71. (Currently amended) The method of claim 1, wherein the microorganisms are present at a concentration of between approximately 10^7 and 10^9 per milliliter ~~during the exposing~~ step.
72. (Original) The method of claim 1, wherein the microorganisms overexpress a gene encoding a protein that reduces the actinide element.

73. (Original) The method of claim 72, wherein the gene encodes a cytochrome c protein.
74. (Original) The method of claim 73, wherein the cytochrome c is a cytochrome c3.
75. (Original) The method of claim 1, wherein the microorganisms overexpress a gene encoding a protein involved in a pathway leading to reduction of the actinide element.
76. (Original) The method of claim 1, wherein the microorganisms express an altered cytochrome c protein, which altered cytochrome c protein displays an increased ability to reduce the actinide element relative to a wild type version of the protein.
77. (Canceled)
78. (Currently amended) The method of claim 1, wherein ~~the exposing step (b)~~ takes place in a medium substantially free of counter ions capable of forming insoluble salts with unreduced ~~molecules of the~~ actinide element.
- 79-81. (Canceled)
82. (Currently amended) The method of claim 78, wherein the medium ~~lacks significant amounts~~ is substantially free of phosphate.
83. (Original) The method of claim 1, wherein the exposing step (b) is performed in the presence of an organic polymer.
84. (Currently amended) The method of claim 1, wherein the method further comprising the a step of:
culturing the microorganisms under aerobic conditions prior to ~~the maintaining~~
step (b) and performing ~~the maintaining~~ step (b) under anaerobic conditions.
- 85-88. (Canceled)

89. (Currently amended) The method of claim ~~186~~, wherein the microorganisms are thermophilic bacteria, and wherein ~~the exposing step (b)~~ is performed at a temperature above 50°C.
90. (Currently amended) The method of claim ~~186~~, wherein the second composition is soluble~~further comprising the step of:~~
~~—extracting some or all of the reduced molecules from the composition.~~
91. (Currently amended) The method of claim 90, wherein the method further comprises~~ing~~
~~the a step of:~~
reextracting the second composition comprising the reduced actinide element
containing molecules into an separate aqueous phase and either reoxidizing them or
collecting them.
92. (Currently amended) The method of claim ~~91~~90, wherein the method further comprises
~~the extracting a step of~~comprises:
forming an extractable organic complex comprising reduced actinide ~~molecules~~
element using an organic ligand; ~~and~~
~~—extracting the extractable complex into an organic phase or onto a solid support~~
~~coated with an organic material.~~
93. (Original) The method of claim 92, wherein the organic ligand comprises
thenoyltrifluoroacetone.
- 94-100. (Canceled)
101. (Currently amended) A method for separating/enriching an isotopes of an actinide element
comprising steps of:
(a) providing a composition comprising ~~molecules comprising an actinide~~
~~element, wherein at least some of the molecules include a first isotope of the actinide~~
~~element and at least some of the molecules include and~~ a second isotope of the actinide
element; and

(b) incubating the composition ~~molecules comprising the actinide element~~ with an actinide reducing enzyme obtained from ~~(an) actinide element reducing microorganism that~~ has reducing activity of the actinide element, thereby ~~allowing formation of a precipitate comprising the actinide element, wherein the precipitate contains~~ forming a second composition comprising the reduced actinide element containing a higher proportion of the second isotope relative to the first isotope than was present in the original composition, thereby enriching the second isotope of the actinide element. ~~effecting a separation of the first and second isotopes; and~~
~~—effecting an increased separation of the first and second isotopes present in the precipitate using any suitable process.~~

102. (Currently amended) The method of claim 101, wherein the second composition is insoluble. ~~further comprising the step of:~~
~~—separating the precipitate from unprecipitated molecules containing the actinide element.~~
103. (Currently amended) The method of claim 102, wherein the method further comprises a ~~the step of separating comprises collecting~~ the second composition using an organic polymer precipitate.
- 104-120. (Canceled)
121. (Original) The method of claim 101, wherein the steps are performed in batch mode.
122. (Original) The method of claim 101, wherein the steps are performed in continuous mode.
123. (Original) The method of claim 101, wherein the enzyme is at least partially purified.
124. (Original) The method of claim 101, wherein an electron donor is present during the incubating step.

125. (Original) The method of claim 101, wherein the actinide reducing enzyme is a cytochrome c enzyme.
126. (Original) The method of claim 125, wherein the cytochrome c is a cytochrome c3.
127. (Original) The method of claim 125, wherein the cytochrome c is at least partially purified.
128. (Currently amended) The method of claim 101, wherein a hydrogenase obtained from an actinide element reducing the microorganism is present during the incubating step.
129. (Original) The method of claim 128, wherein the hydrogenase is at least partially purified.
130. (Original) The method of claim 128, wherein an electron donor in addition to hydrogenase is present during the incubating step.
131. (Canceled)
132. (Currently amended) The method of claim 101, wherein a material providing a nucleation site to precipitate the second composition~~for uraninite formation~~ is provided during the incubating step.
133. (Original) The method of claim 101, wherein the incubating step is performed in a fixed enzyme reactor.
- 134-154. (Canceled)
155. (New) The method of claim 101, wherein the actinide element is uranium.
156. (New) The method of claim 155, wherein the second composition comprises uraninite.
157. (New) The method of claim 155, wherein the enzyme reduces uranium from the U(VI) state to the U(IV) state.

158. (New) The method of claim 155, wherein the first isotope is heavier than the second isotope.
159. (New) The method of claim 155, wherein the first uranium isotope is U-238.
160. (New) The method of claim 155, wherein the second uranium isotope is U-235.
161. (New) The method of claim 155, wherein the first uranium isotope is U-238 and the second uranium isotope is U-235.
162. (New) The method of claim 1, wherein the actinide element is uranium and the microorganisms are members of bacterial genus *Shewanella*.
163. (New) The method of claim 162, wherein the actinide element is uranium and the microorganisms are members of bacterial strain *Shewanella oneidensis*.
164. (New) The method of claim 162, wherein the first uranium isotope is U-238 and the second uranium isotope is U-235.

REMARKS

Claims 1-154 were pending in this application. Claims 8, 13-21, 24-36, 39, 42, 77, 79-81, 85-88, 94-100, 104-120 and 134-154 are now cancelled without prejudice to Applicants' right to prosecute their subject matter in the present application and in related applications. Claims 62, 66 and 70 are withdrawn. Claims 1-7, 9-12, 22, 23, 37, 38, 40, 41, 43, 44, 47, 49, 61, 71, 78, 82-84, 89-92, 101-103, 132, 133 have been amended without any intent of disclaiming equivalents thereof. New claims 155-164 are added. Accordingly, upon entry of this paper, claims 1-7, 9-12, 22, 23, 37, 38, 40, 41, 43-57, 60, 61, 63-65, 67-69, 71-76, 78, 82-84, 89-93 and 101-103, 121-133, and 155-164 are pending and presented for consideration.

Claim amendments

Support for the claim amendments can be found in the specification and claims as originally filed. Exemplary support are provided as follows.

| Claims | Exemplary Support |
|------------------|------------------------------------|
| 1 | Paragraphs 0017 and 0018 |
| 2 | Paragraph 0009 |
| 3 | Paragraph 0017 |
| 4 | Paragraph 0009; original claim 4 |
| 5 | Original claim 5 |
| 6 | Paragraph 0058 |
| 7, 9, 10, 11, 12 | Paragraph 0039 |
| 22 | Paragraph 0054; original claim 106 |
| 23 | Paragraph 0047 |
| 40 | Paragraph 0035 |
| 41 | Paragraph 0035 |

| | |
|-----|-----------------------------------|
| 43 | For clarification |
| 47 | For clarification |
| 49 | For clarification |
| 61 | For clarification |
| 63 | For clarification |
| 71 | For clarification |
| 78 | For clarification |
| 82 | Paragraph 0024 |
| 84 | For clarification |
| 89 | For clarification |
| 90 | Paragraph 0017 |
| 91 | Paragraph 0044 |
| 92 | Paragraph 0045 |
| 101 | Paragraphs 0055-0058 |
| 102 | Paragraph 0017 |
| 103 | Paragraph 0043; original claim 83 |
| 128 | For clarification |
| 132 | For clarification |
| 155 | Paragraph 0008 |
| 156 | Paragraph 0017 |
| 157 | Paragraph 0022 |
| 158 | Original claim 51; abstract |

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| 159 | Original claim 52 |
| 160 | Original claim 53 |
| 161 | Original claim 54 |
| 162 | Paragraphs 0023 and 0038; original claim 68 |
| 163 | Original claim 69 |
| 164 | Original claim 54 |

Applicants respectfully submit that the amendments to the claims introduce no new matter.

Claim rejections under 35 U.S.C. §112, first paragraph

Claims 1-23, 37-57, 60, 61, 63-65, 67-69, 71-84, 86-96, 101-107, 121-133, 136-143 and 146-153 stand rejected under 35 U.S.C. §112, as allegedly failing to comply with the enablement requirement. Specifically, the Office Action alleges that the molecular structure of “molecules” recited in the claims has not been fully disclosed and enabled. See, the Office Action, page 5. In addition, the Office Action alleges that the specification does not support the terms “exposing,” “formation of a precipitate,” “thereby effecting a separation of the first and second isotopes” and “removing the reduced actinide element” recited in the claims. See, the Office Action, page 5.

Without acquiescing to the rejection, and solely to advance prosecution, Applicants have amended the claims to delete the terms “molecules,” “exposing,” “formation of a precipitate,” “thereby effecting a separation of the first and second isotopes” and “removing the reduced actinide element.” Therefore, Applicants submit that the claims as amended fully comply with the enablement requirement and respectfully request the rejection under 35 U.S.C. §112, first paragraph, be reconsidered and withdrawn.

Claim rejections under 35 U.S.C. §112, second paragraph

Claims 1-23, 37-57, 60, 61, 63-65, 67-69, 71-84, 86-96, 101-107, 121-133, 136-143 and 146-153, stand rejected under 35 U.S.C. §112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Without acquiescing to the rejection, and solely to advance prosecution, Applicants have amended the claims to delete the objected-to terms including "molecules," "exposing," "reducing microorganisms," "formation of a precipitate," "effecting a separation," "using any suitable process," "performed for a time selected for a time to achieve reduction of less than . . . of the actinide element," and "removing the reduced element." Therefore, Applicants submit that the claims as amended are clear and unambiguous and respectfully request the rejection under 35 U.S.C. §112, second paragraph, be reconsidered and withdrawn.

CONCLUSION

In view of the amendments and the arguments above, Applicants believe that all rejections have been overcome. The Examiner is invited to telephone the undersigned attorney to discuss any remaining issues. Early and favorable actions are respectfully solicited.

Date: May 27, 2008

Respectfully submitted,

/Fangli Chen/

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